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FCC Office of the Secretary

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)

)
) Cricket License Company, LLC Petition for a
) Waiver of Section 27.60 of the Commission's
) Rules to Allow Deployment on Lower 700
) MHz A Block Spectrum in Chicago, Illinois)

Call Sign WQJQ707

FCC File No. _____

**PETITION OF CRICKET LICENSE COMPANY, LLC
FOR A WAIVER OF DTV PROTECTION CRITERIA**

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FOR A WAIVER OF DTV PROTECTION CRITERIA**

Cricket License Company, LLC, together with its parent companies, Cricket Communications, Inc. and Leap Wireless International, Inc. (collectively "Cricket"), hereby request a waiver of the Section 27.60 digital television ("DTV") signal protection criteria to allow the deployment of commercial service on Cricket's Lower 700 MHz A Block license (call sign WQJQ707) (the "License") in the Chicago-Gary-Kenosha, IL-IN-WI BEA (BEA064) (the "Market"). The potential for interference into the adjacent Channel 51 DTV broadcast station, WPWR-TV (Gary, Indiana) (the "Station") operated by Fox Television Stations, Inc. ("Fox"), is *de minimis*, and the probability that viewers of the Station's signal will suffer from interference is highly unlikely. Grant of the requested waiver is in the public interest, because it would promote more rapid deployment on the Lower 700 MHz A Block spectrum in Chicago (the "Licensed Spectrum") and would expand the availability of wireless broadband services to consumers in the Chicago area.

I. INTRODUCTION AND SUMMARY

Surging demand for wireless broadband services across the United States has strained the available network capacity, requiring additional spectrum resources to support these services. Since its release of the National Broadband Plan in 2010, the Commission has

instituted a number of proceedings that seek to relieve the current spectrum crunch. The Commission has acknowledged that the sharp increase in mobile broadband data use is attributable in large part to the prevalence of smartphones enabling wireless Internet access by greater numbers of consumers. Cricket's core focus has been serving consumers in urban areas who may not be able to qualify for or afford wireless or wireline services from larger carriers. For many customers in this segment, mobile handsets serve as a primary connection to the Internet. Cricket offers services and rate plans designed to serve these customers, and has expanded its offerings to include a broad selection of affordable, high-performance devices to the prepaid customer segment, including smartphones. Accordingly, Cricket has experienced first-hand the rising demand for wireless broadband services and the critical need for increased network capacity — in this case, particularly in Chicago.

Cricket currently provides service in the Chicago area using only 10 MHz of AWS spectrum, which is insufficient to meet the growing consumer demand for wireless broadband services in that market. In an effort to add the necessary capacity to its network in the Chicago area to upgrade to LTE, Cricket acquired 12 MHz of Lower 700 MHz A Block spectrum from Verizon Wireless in August 2012. Cricket has been unable to deploy broadband services using that spectrum, however, because of Commission rules that establish an exclusion zone to protect the operations of the adjacent Channel 51 broadcast station even where the risk of interference is *de minimis*.

Recognizing the difficulties that Lower 700 MHz A Block licensees in particular have encountered in seeking to deploy wireless services, the Commission has worked vigorously toward an industry agreement that will facilitate the development of a market for interoperable

devices operating across the Lower 700 MHz bands.¹ In doing so, the Commission granted relief to Lower 700 MHz A Block licensees like Cricket that have faced challenges overcoming the regulatory protections afforded to Channel 51 broadcast operations.² Cricket applauds the Commission's successful outcome in that proceeding and welcomes the much-needed relief, which will pave the way for Lower 700 MHz A Block licensees to deploy service and put the spectrum to use. By waiving the interim construction benchmark for Lower 700 MHz A Block licensees in market areas that substantially overlap with the area surrounding a Channel 51 transmitter, the Commission has acknowledged the significant challenges that Cricket and other similarly situated licensees confront in endeavoring to deploy service on this spectrum.³

Despite the Commission's efforts to date, however, the Lower 700 MHz A Block spectrum in the Chicago area remains unusable for LTE service in the near term because of an alleged need to protect incumbent broadcaster transmissions on Channel 51. Cricket has undertaken extensive efforts to identify and resolve any potential interference into Channel 51 broadcast operations in Chicago. Cricket has invested significant time and resources toward studying the potential impact of wireless LTE deployments on the DTV signal reception of the Station, including commissioning extensive independent laboratory tests and probability analyses. Using conservative/worst-case scenario assumptions, the testing and analyses have concluded that Cricket's proposed deployment would impact only about 20 viewers watching the

¹ *Promoting Interoperability in the 700 MHz Commercial Spectrum; Requests for Waiver and Extension of Lower 700 MHz Band Interim Construction Benchmark Deadlines*, WT Docket Nos. 12-69, 12-332, Report and Order and Order of Proposed Modification, FCC 13-136 (rel. Oct. 29, 2013) ("*Interoperability Order*").

² *See id.*

³ *See id.* at ¶ 65.

Station's signal over-the-air while operating an LTE handset more than 1.5 meters away from the DTV receiver antenna.

Based on these favorable test results, Cricket sought to negotiate a consensual arrangement with the Station to facilitate the use of the Licensed Spectrum for LTE service while mitigating any potential for interference. However, the Station has refused to engage in a constructive dialogue to identify and resolve any legitimate interference concerns the Station may have. After these sustained efforts over nearly two years, it is now apparent that Cricket requires a waiver of the DTV broadcast station interference protection criteria set forth in Section 27.60 of the Commission's rules to enable deployment of a viable service on the Licensed Spectrum in the Chicago area.

A waiver is warranted by the severe spectrum constraints in this market and the lack of any realistic probability of interference to the Station's viewers. Granting the requested waiver would serve the public interest by allowing full and efficient use of scarce spectrum resources in the near term in Chicago. As the Commission has recognized, there is a critical need for additional spectrum resources, particularly spectrum below 1 GHz, in densely populated urban areas. This is especially true for Chicago, the third largest U.S. city and one of the most densely populated metropolitan areas in the country. Significantly, the high demand for spectrum in Chicago in particular is evidenced by the fact that the Lower 700 MHz B Block license in this market commanded the highest price per MHz*POP among comparable licenses in Auction 73.

Although the Commission's upcoming incentive auction of the 600 MHz broadcast spectrum and the accompanying DTV station repacking should eventually lead to full and ubiquitous deployment in the Lower 700 MHz A Block, grant of this waiver request now

will allow deployment of wireless broadband service on this spectrum during the time (potentially several years) in which that proceeding will be pending and the auction and repacking processes are being implemented. And a waiver of Section 27.60 would not frustrate the underlying purpose of the rule, which aims to protect DTV operations, because of the extremely remote probability that a DTV viewer will be adversely impacted. Moreover, a waiver of the DTV protection criteria in this instance is entirely consistent with and, indeed, affirmatively promotes the Commission's goals and policy objectives surrounding the upcoming incentive auction and the associated repacking of broadcast stations — improving the productive use of the nation's radio spectrum and making additional spectrum available to meet the burgeoning demand for wireless telecommunications.

Finally, Cricket respectfully requests that any waiver relief granted in this proceeding be transferrable to a future successor to Cricket that purchases and acquires *de facto* control of the License, as contemplated in the pending transfer of control of Cricket to AT&T Inc. ("AT&T").⁴ Originally, Cricket anticipated building out the Licensed Spectrum to deploy LTE on its own network in Chicago. However, Cricket since has become a party to a pending transformative transaction with AT&T. After the acquisition of Cricket by AT&T, Leap's shareholders will receive a contingent value right entitling them to the proceeds from the eventual sale of the License to a third party. Thus, it is contemplated that the License will be sold and constructed by a carrier other than Cricket. Even if Cricket's interference analysis described above were scaled for deployment by a successor carrier, the projected number of

⁴ See *AT&T Inc., Leap Wireless International, Inc., Cricket License Company, LLC, and Leap Licenseco, Inc. Seek Consent to the Transfer of Control of AWS-1 Licenses, PCS Licenses, and Common Carrier Fixed Point to Point Microwave Licenses, and International 214 Authorizations, and the Assignment of One 700 MHz License*, WT Docket No. 13-193, Public Notice, DA 13-1831 (rel. Aug. 28, 2013).

viewers likely to be impacted would still be *de minimis*. The analysis demonstrating the *de minimis* impact of deployment on the Licensed Spectrum is dependent in large part on the characteristics of the Station and the Chicago market area as described below and in the technical reports attached hereto, and therefore would be applicable to any successor carrier to Cricket. The likelihood of interference caused by LTE operations of a carrier with greater coverage than Cricket in the Chicago area would similarly be extremely low.

II. A WAIVER IS NECESSARY TO FACILITATE THE DEPLOYMENT OF SERVICE ON THE LICENSED SPECTRUM IN CHICAGO'S URBAN CENTER

A waiver of the DTV protection criteria is necessary in order to allow LTE technology to be deployed on the Licensed Spectrum and to expand the available capacity needed to meet the growing demand for wireless broadband services in Chicago. Since it first considered the acquisition of the License from Verizon Wireless, Cricket understood the need to resolve any potential interference into adjacent Channel 51 operations. Specifically, Lower 700 MHz A Block licensees are required to protect broadcast operations on the adjacent UHF Channel 51 in accordance with the DTV broadcast station interference protection criteria set forth in Section 27.60 of the Commission's rules. The rule requires Lower 700 MHz operations to meet a minimum desired signal-to-undesired signal ("D/U") ratio of -23 dB at the Grade B contour (which has a radius of approximately 55 miles) of a full power Class A television station operating on an adjacent channel.⁵ If the D/U ratio is exceeded, the wireless licensee is required to maintain a five-mile minimum separation distance from the Grade B contour of the station,⁶ effectively creating a 60-mile exclusion zone around the DTV station transmitter site. The rule provides in these circumstances that a wireless licensee must obtain the consent of the adjacent

⁵ 47 C.F.R. § 27.60(a)(2).

⁶ *Id.* at § 27.60(b)(2)(ii)(C).

broadcast station in order to operate within this exclusion zone,⁷ or alternatively, seek relief from the Commission.

Any wireless LTE operations deployed to serve the populous urban center of Chicago would require coverage within the exclusion zone surrounding the Station's transmitter. Such operations would exceed the D/U threshold in the rule and have the potential to cause interference into DTV operations, albeit only to a *de minimis* number of viewers. Without the Station's consent or a waiver from the Commission, the 60-mile exclusion zone created by the rule significantly limits the areas in the Market in which Cricket can construct LTE base stations and provide service to customers, regardless of the actual impact of any proposed operations on the Licensed Spectrum. Cricket's (or a successor carrier's) ability to deploy LTE service within the coverage area of the Station's signal in the Chicago area is critical to the economic feasibility of providing service using the Licensed Spectrum, because the DTV signal of the Station covers the most densely populated portion of the Market, including Chicago's urban center, as illustrated on the maps attached as Exhibit A.

Indeed, the exclusion zone covers approximately 90 percent of the licensed population in the Chicago market area. Although facilities technically could be constructed to provide service within the portions of the licensed geographic area that are located outside of the Station's signal, coverage of such facilities would encompass only the small remainder of the population located outside of the exclusion zone. In other words, in the absence of consent from the DTV station or a grant of the requested waiver of the rule, Cricket or a successor carrier would only be able to use the Licensed Spectrum to serve — at most — 10 percent of the population in the licensed area. Thus, the fact that the population density in the Chicago market

⁷ *Id.* at § 27.60(b)(1)(iv).

area is concentrated within the Station's exclusion zone renders it practically impossible for a commercially viable service to be deployed on the Licensed Spectrum without the consent of the DTV station or the waiver requested herein.

Critically, Cricket's evaluation of the potential for interference demonstrates that the probability of impairment to a viewer's ability to watch the Station's signal is extremely low, as described in more detail below. However, despite the lack of any realistic harm, and despite Cricket's detailed explanation of its extensive test results, the Station has refused to engage in substantive discussions exploring a negotiated resolution to any interference concerns that the Station may have. Because the rule does not allow a wireless licensee to operate within the exclusion zone — even where there is little, if any, actual interference — a waiver is required in this instance.

III. THE POTENTIAL FOR INTERFERENCE FROM CRICKET'S PROPOSED DEPLOYMENT IS *DE MINIMIS*

Through independent testing and analysis, Cricket has determined that only about 20 viewers in the Chicago area may be impacted if they are watching the Station's over-the-air ("OTA") signal while using an LTE handset at a distance 1.5 meters or greater from the DTV receiver antenna. Given the extremely low number of viewers that are potentially impacted, any interference from Cricket's proposed LTE operations into the Station's signal would be *de minimis*. Moreover, at short separation distances, interference can be managed by simply moving the handset farther away from the DTV receiver antenna or by reorienting the LTE device. Because transmissions from LTE handset antennas are highly directional, even a slight reorientation of the LTE handset can typically correct any interference issues. Notably, the Commission has recognized that potential interference between devices within separation distances of 10 meters can be resolved by the consumer, because within that distance, the

television set and the consumer device are likely either within the same household, or there are typically mitigating circumstances, such as greater attenuation due to walls or furniture.⁸ Thus, in the small number of instances in which a viewer's use of an LTE handset could affect the DTV signal, the viewer can significantly decrease the impact to the DTV signal by simply turning their head while using their LTE handset or moving the LTE handset away from the television set.

A. Cricket's Findings Were the Result of Thorough and Detailed Testing and Analysis of the Market

The findings of *de minimis* interference were the result of testing and analysis commissioned by Cricket to evaluate the nature and level of interference, and to assess the ease of coexistence, of its planned LTE deployment with the Station's over-the-air television signal on the adjacent Channel 51. In particular, the probability analysis was tailored specifically to the Station's signal and the Market. To ensure that the results were unbiased, Cricket retained independent consultants and laboratory facilities to design and conduct the testing. The RF study was designed by Dane Ericksen, P.E. of Hammett & Edison, Inc., who has significant expertise in broadcast engineering, in cooperation with Intertek Testing Services NA, Inc. ("Intertek"), which provided input regarding CMRS engineering aspects of the RF study design. The interference testing was conducted by Intertek, and the results of the testing were incorporated into the probability analysis conducted by Newfield Wireless, Inc. ("Newfield"). The

⁸ *Amendment of Part 15 to Redefine and Clarify the Rules Governing Restricted Radiation Devices and Low Power Communications Devices*, Opinion, 79 FCC 2d 28 ¶¶ 54-55, Appendix C (1979) (assuming a separation distance of 10 meters in establishing a power limit in Part 15 for computing devices and recognizing that when a TV receiver and computing device are within the same household, the occupant can remedy or minimize any interference by moving the devices further apart or reorienting the equipment). Notably, moving or reorienting an LTE handset is much simpler than moving the types of computing devices that were prevalent at the time the Commission adopted the Part 15 limit.

engineering report prepared by Intertek ("Intertek Report") and the probability analysis prepared by Newfield ("Newfield Report") are attached hereto as Exhibits B and C, respectively. All technical assumptions and parameters underlying the testing and analysis are detailed extensively in the Intertek and Newfield Reports in a wholly transparent manner.

The testing and analysis sought to establish a realistic measure of the potential interference that Cricket's proposed LTE deployment could pose to the OTA viewers of the Station's Channel 51 DTV signal. The potential for interference arises from the operation of LTE handsets on Channel 52 frequencies. Pursuant to the Lower 700 MHz band plan established by the Commission, LTE handsets in the A Block transmit on frequencies in Channel 52, which is directly adjacent to the Channel 51 DTV broadcast signal.⁹ In contrast, A Block LTE base stations transmit on the paired A Block frequencies in Channel 57. Such transmissions are isolated from Channel 51 DTV operations, and thus do not present an interference issue for Channel 51 DTV operations.

The -23 dB D/U limit in the Commission's rule provides the threshold at which DTV signals are deemed to be adequately protected. In general, DTV D/U threshold limits are typically used as a measure allowing broadcast stations to determine the required separation distance needed to avoid interference between fixed broadcast tower locations.¹⁰ However, a single threshold value does not necessarily reflect the actual interference environment as it may

⁹ See *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, Second Report and Order, 22 FCC Rcd 15289 ¶ 65 (2007).

¹⁰ See, e.g., *Amendment of Parts 73 and 74 of the Commission's Rules to Establish Rules for Digital Lower Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations*, Report and Order, 19 FCC Rcd 19331 ¶ 88 (2004) (establishing standards for protection of DTV stations from LPTV and TV translator stations and confirming that D/U ratios provide an accurate basis for analyses of predicted interference to and from digital TV stations).

exist with a particular wireless technology.¹¹ Instead, the impact of adjacent wireless operations on the viewability of a DTV signal is a function of a number of variables.

As an initial matter, the actual interference into a DTV receiver is dependent upon the sensitivity of the DTV receiver. Thus, Cricket's testing first measured the sensitivity levels of a wide range of popular DTV receiver models to determine the threshold at which a DTV receiver can no longer pick up a weak DTV signal due to interference. Although the Section 27.60 protection criteria mandate a D/U ratio of -23 dB, testing showed that DTV receivers currently on the market can withstand a smaller D/U margin without suffering a degraded picture.

In addition, a number of variables relating to LTE handset operations may impact the level of interference experienced by a DTV receiver. Due to the mobile nature of LTE handset operations, the distance between the LTE handset and the DTV receiver will vary. Moreover, LTE handset antennas are directional, and thus, changing the angle of orientation of the LTE device antenna toward the DTV receiver antenna can significantly impact the level of interference into the DTV signal. Furthermore, LTE handsets are designed to operate on the lowest power level necessary to maintain reliable communications, and therefore, the power level of the LTE handset will also vary. In most cases, under normal operating conditions, the handset will not be operating at full power. Each of these variables changes dynamically, and thus, Cricket's interference analysis relied on assumptions that were either conservative or worst-case to account for the effect of each of these factors. For instance, Cricket assumed that the LTE handset is always transmitting at the maximum power level achievable by the device, and

¹¹ By incorporating station consent as an alternative, the rule contemplates scenarios where wireless operations may exceed the D/U limit within a DTV station's Grade B contour, but where the DTV signal is not subject to harmful interference.

accounted for coupling loss between the LTE handset antenna and the DTV antenna (*e.g.*, the mitigation of interference due to the degree of alignment between the two antennas) through a standard statistical model.

Finally, the impact of LTE handset operations will depend on the desired DTV receiver signal level and the level of over-the-air viewership of the Station. Even within a DTV station's Grade B contour, the DTV signal strength will vary based on the specific location within the contour. Therefore, Cricket's studies incorporated predictions about the Station's signal strength consistent with widely accepted FCC OET studies and reports, including the FCC OET Bulletin 69 Longley-Rice Methodology for Evaluating TV Coverage and Interference.¹² In calculating the probability of DTV interference within the Station's coverage area, the analysis also made extremely conservative assumptions about the locations and the distribution of the Station's viewers, including (i) the use of the highest level of OTA viewership reported in Nielsen data with an upward adjustment to account for the assumption that lower-income customers are more likely to view the Station's signal over the air (rather than over a cable or satellite system); (ii) assuming all such OTA viewers are located within the exclusion zone; and (iii) assuming that all OTA viewers have only an indoor DTV antenna. The probability analysis also assumed that all Cricket subscribers would have an LTE device.

Notably, even when the analysis is conducted assuming a network configuration of a larger carrier with a greater number of subscribers in the Chicago area, the impact of such deployment would still be *de minimis*. In fact, the potential for interference from a subscriber of other carriers would likely be substantially less than for a Cricket subscriber. In general, other carriers in the Chicago area have more comprehensive network coverage than Cricket in the

¹² The OET Bulletin 69 predictive model was used in the probability analysis. However, Cricket's testing included actual over-the-air signal measurements, as described above.

Chicago area, including in the exclusion zone surrounding the Station, as illustrated in the maps in Exhibit A. Importantly, while the number of subscribers of other carriers in the Chicago area may be greater than Cricket's, Cricket has observed that these other carriers have a greater number of base stations and operate networks with denser and more robust coverage than Cricket, which in general reduces the power level at which the LTE handsets need to operate. In addition, the subscribers of other carriers that do not focus solely on the prepaid demographic are more likely to have a cable or satellite subscription, and thus are less likely to be impacted by operations on the Licensed Spectrum.¹³

As a result of these factors, any interference resulting from the LTE operations of another carrier in the exclusion zone would also be *de minimis*. For example, Cricket calculated the projected number of affected viewers of the Station's signal based on available subscriber data for the four largest carriers in the Chicago area. The results of Cricket's projections show that the affected number of viewers would still be limited to approximately 100 viewers (assuming such viewers were using their LTE handsets 1.5 meters or greater from the DTV receiver antenna). While the number of potentially impacted subscribers would be marginally higher for the nation's four largest carriers than for Cricket, the overall result would still be an insignificant probability of any harmful interference.

¹³ See Leichtman Research Group, Press Release, *Cable, DBS & Telcos: Competing for Customers 2013* (Aug. 8, 2013) ("Nationwide, 20% of TV households with annual incomes <\$50,000 are non-subscribers, compared to 9% with incomes >\$50,000 – a division that has been fairly consistent for years"), available at <http://www.leichtmanresearch.com/press/080813release.html>. Nielsen data for the third quarter of 2013 indicate that over 80 percent of Cricket's customer households have annual incomes of less than \$50,000. See Nielsen Mobile Prepaid Insights, U.S., Q3 2013.

B. Cricket's Engineering Methodology and Approach Are Consistent with the Commission's Precedent and Industry Practices

The testing methodology and predictive engineering models employed in Cricket's analysis are fully consistent with the Commission's testing approaches and prior precedent waiving DTV protection criteria. The design of the RF study and the assumptions and predictions in the Intertek Report and the Newfield Report are consistent with the methodologies previously approved by the Commission as the basis for evaluating the potential for DTV interference. As a threshold matter, the Commission has afforded licensees flexibility in selecting an engineering methodology for studies submitted pursuant to Section 27.60,¹⁴ and has approved such studies where the study clearly outlines the analytical and technical processes it employed to evaluate interference potential and is demonstrated to be consistent with generally accepted engineering practices.¹⁵

Furthermore, the Commission has acknowledged that predictive approaches to evaluating interference potential are appropriate. In other cases where the Commission has granted a waiver of the DTV protection criteria from mobile interference sources, the Commission concluded that statistical modeling is the most appropriate method to analyze the

¹⁴ See, e.g., *Qualcomm Incorporated Petition for Declaratory Ruling*, Order, 21 FCC Rcd 11683 ¶ 17 (2006) ("*Qualcomm Order*") (recognizing that Section 27.60 does not specify an engineering methodology to be used in studies); see also *Access Spectrum, LLC Request for Waiver of Section 27.60*, Memorandum Opinion & Order, 19 FCC Rcd 15545 ¶ 10 (2004) ("*Access Spectrum Order*") (confirming that an engineering study consistent with the requirements of Section 27.60(b)(1)(iii) is required for waiver showings).

¹⁵ See, e.g., *State of New York, Request for Waiver of Section 90.545 of the Commission's Rules to Implement a 700 MHz Public Safety System in Specified Counties in the Greater New York City Metropolitan Area*, Order, 22 FCC Rcd 22195 ¶ 23 (2007) ("*New York State Order*"). Although this case involved a waiver of DTV protection criteria rule for public safety licensees using 700 MHz spectrum under Part 90, Section 90.545 served as the model for the Part 27 DTV protection rule. See, e.g., *Qualcomm Order* at ¶ 16.

random nature of such interference.¹⁶ In addition, the Commission has acknowledged that FCC OET Bulletin 69 provides an engineering methodology widely accepted in the industry for making DTV field strength predictions and is appropriate for use in determining the potential impact of adjacent wireless operations, provided that adjustments are made in the engineering analysis to reflect characteristics of the wireless operations.¹⁷ The Commission's prior decisions granting waivers of the DTV protection criteria are instructive, despite the differences in the wireless service at issue or the level and nature of such deployment, because the critical inquiry is the demonstration that no significant harmful interference is likely to occur.¹⁸

IV. THE STATION HAS BEEN UNWILLING TO WORK WITH CRICKET IN A PRODUCTIVE OR TIMELY MANNER

Despite Cricket's findings, which overwhelmingly demonstrate that proposed wireless LTE deployment in the Chicago area will be capable of coexisting with the Station's operations, the Station has been entirely unwilling to discuss a consent agreement to facilitate

¹⁶ *New York State Order* at ¶ 21 ("statistical modeling is the most appropriate method to analyze the random nature of mobile-into-fixed interference"). The Commission has also acknowledged in other contexts that statistical modeling is appropriate to measure interference in mobile environments. *See, e.g., Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands*, Report and Order and Order of Proposed Modification, 27 FCC Rcd 16102 ¶ 85 (2012) ("*AWS-4 Order*") (when establishing a limit for mobile-into-mobile interference, the probability of interference depends on the likelihood of the interfering sources to come into close proximity under the right conditions: "To evaluate this probability, we make reasonable assumptions about interference and look at the separation needed between mobile devices to prevent interference with those assumptions").

¹⁷ *See, e.g., Qualcomm Order* at ¶¶ 17, 18. Moreover, Congress has mandated the use of the methodology set forth in OET Bulletin 69 as the basis for determining the coverage area and population served by each broadcast television licensee in the repacking process in connection with the anticipated broadcast spectrum incentive auction. Middle Class Tax Relief and Job Creating Act of 2012, Pub.L.No. 112-96, § 6403(b)(2), 125 Stat. 156 (2012).

¹⁸ *New York State Order* at ¶ 20 (finding irrelevant the scale of deployment or whether that deployment is fixed-into-fixed or mobile-into-fixed).

such deployment. Cricket has tried repeatedly to engage the Station in discussions to achieve a resolution of any concerns the Station may have about the potential for interference. However, the Station has continually failed to respond in a productive or timely manner. Cricket reached out to Station representatives early in 2012, even before closing on the acquisition of the Lower 700 MHz A Block license from Verizon Wireless. Initially, Cricket attempted to work with the Station to explore alternative DTV channels that could be suitable for relocation and provided the Station with a study on the potential alternative channels. However, the Station was not willing to pursue this proposed approach, citing uncertainty and logistical complexities.

Over the course of three months after the relocation proposal was rejected, Cricket reached out to the Station on multiple occasions and invited the Station to participate in signal testing to determine the extent of the potential for interference. Cricket offered to cover all of the Station's expenses for participation. The Station rejected this invitation, and Cricket proceeded with its commissioned testing in the middle of 2012, which resulted in the production of the Intertek Report and the Newfield Report described above. The testing and studies were completed by the end of 2012, with results showing that fewer than 20 viewers may be impacted if the separation distance between Cricket's LTE handset and the DTV receiver is 1.5 meters or greater.

Cricket promptly shared its detailed reports and analysis with the Station, and provided the attached Intertek and Newfield Reports in their entirety. After giving the Station an opportunity to review the Reports, Cricket met with the Station's technical staff in February 2013. Cricket offered to provide the Station with testing equipment worth approximately \$50,000 that could be used to replicate Cricket's RF study, but the Station declined Cricket's offer. In late April, the Station informed Cricket that it would conduct its own "predictive"

interference testing. The Station refused to allow Cricket to participate in any manner and refused to provide any information regarding the Station's test plan. Thus, Cricket is unaware of the basis of the Station's testing or what the testing actually entailed.

The Station's consulting engineers produced a test report dated June 7, 2013. On July 17, 2013, over a month later (and in response to repeated requests), the Station provided Cricket with only the report's conclusions set forth in an executive summary that contained little detail and which appeared to be based only on predictive models that did not account for any measured data or other adjustments necessary to reflect realistic operating conditions of LTE networks.¹⁹ Cricket asked several times for the detailed testing report, along the lines of what Cricket provided to the Station, but the Station flatly rejected these requests. The executive summary of the Station's report failed to identify any legitimate issues or interference concerns, and in addition, contained a number of errors and misunderstandings about Cricket's analysis. In response, Cricket provided a memorandum to the Station refuting each of the Station's arguments. Cricket hoped to have a technical discussion with the Station to clarify and resolve the inconsistencies, particularly given the limited analysis that the Station provided, but the Station has consistently refused to engage on any level.

As things stand, the Station appears entirely unwilling to explore seriously the coexistence with wireless operations in the Lower 700 MHz A Block or the grant of its consent pursuant to Section 27.60. Given these circumstances, Cricket now is left with no alternative but to seek a waiver of the requirement.

¹⁹ See *supra* 15, n.17.

V. A WAIVER IS WARRANTED BY THE INSIGNIFICANT POTENTIAL FOR HARMFUL INTERFERENCE AND THE PUBLIC INTEREST BENEFITS OF LTE DEPLOYMENT

A waiver of the DTV protection criteria in this case is in the public interest and is warranted by the lack of any realistic probability of harmful interference to the Station's operations. The waiver standard set forth in Section 1.925 of the Commission's rules provides that the Commission may waive specific requirements in the rules upon request if (a) the underlying purpose of the rule would not be served or would be frustrated by the application of the rule, and a waiver would serve the public interest; or (b) unique or unusual circumstances are presented such that it would be inequitable, unduly burdensome or contrary to the public interest to enforce the rule, and the applicant has no reasonable alternative.²⁰ The Commission has authority to waive its rules where there is "good cause" to do so.²¹ The Commission may exercise its discretion to waive a rule where the facts and circumstances would make strict compliance inconsistent with the public interest.²² As discussed in detail below, the waiver standard is satisfied in this instance.

A. Grant of a Waiver Would Advance the Public Interest

There is no question that allowing the productive use of the Lower 700 MHz A Block spectrum, and thereby expanding the available capacity for wireless broadband services, in the Chicago area would advance the public interest. The growing demand for wireless broadband services and the surging need for network capacity are well documented, principally

²⁰ 47 C.F.R. § 1.925(b)(3).

²¹ *Id.* at §§ 1.3, 1.925.

²² *See, e.g., WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969).

in urban areas.²³ Chicago, the third largest U.S. city and one of the most densely populated areas in the country,²⁴ is a prime example of an urban market in which wireless carriers face spectrum constraints. Indeed, the Lower 700 MHz B Block license in Chicago acquired by Verizon Wireless at auction yielded the highest price/MHz*POP among comparable licenses in Auction 73 by a wide margin, illustrating the high demand for spectrum in this market in particular even by the largest carriers.²⁵ More generally, the goals of making more spectrum available for mobile wireless broadband and ensuring efficient use of spectrum have been the basis for a number of recent Commission actions in furtherance of implementing the recommendations of the National Broadband Plan.²⁶ The Commission has acknowledged in a wide range of proceedings the urgent need to make spectrum available, particularly in lower frequencies, and to facilitate mobile broadband deployment to meet the increasing consumer demand for wireless broadband services and expanded network capacity.²⁷

²³ See, e.g., Federal Communications Commission, *Connecting America: The National Broadband Plan* at 85, 93 (2010) (recognizing that “increased spectrum demands are primarily an urban phenomenon,” and identifying urban areas as particularly high congestion areas) (“*National Broadband Plan*”).

²⁴ Based on 2010 U.S. Census data, available at <http://www.census.gov/2010census>.

²⁵ See *Auction of 700 MHz Band Licenses Closes, Winning Bidders Announced for Auction 73*, Public Notice, DA 08-595 (rel. Mar. 20, 2008).

²⁶ See *National Broadband Plan* at 75,85 (recommending that the Commission make 500 MHz of spectrum available for broadband use by 2020, of which 300 MHz should be below 3.7 GHz, and promote access to unused and underutilized spectrum).

²⁷ *Service Rules for Advanced Wireless Services H Block – Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz Bands*, Report and Order, 28 FCC Rcd 9483 ¶ 2 (2013) (“The demand for increased wireless spectrum, moreover, is expected to continue increasing. In response, the Commission continues to work to free up additional licensed and unlicensed spectrum to meet this growing demand.”) (“*AWS H Block Order*”); *AWS-4 Order* at ¶ 3 (“Demand for wireless broadband services and the network capacity associated with those services is surging, resulting in a growing demand for spectrum to support these services.”); *Reexamination of Roaming Obligations of Commercial Mobile*

In particular, the Commission's incentive auction proceeding, which seeks to repurpose broadcast spectrum for wireless broadband services, underscores the high priority for making more spectrum available for wireless broadband services.²⁸ Grant of the requested waiver is consistent with the efforts underway in that proceeding to clear broadcast spectrum and allow greater access to spectrum for wireless broadband services. Indeed, the Commission has acknowledged specifically the important public interest benefits of removing the limitations on Lower 700 MHz A Block operations, via the clearing of Channel 51 broadcast stations.²⁹ In granting Qualcomm's request for waiver of the DTV protection criteria, the Commission recognized "that it is in the public interest generally to effect forward-looking policy that drives toward the end-point of the DTV transition."³⁰ Likewise, in this case, granting the requested waiver would be consistent with and would further the Commission's goal of clearing the 600 MHz band in the incentive auction. Although broadcasters are set to be relocated in connection with the incentive auction, issues relating to the clearing of Channel 51 are unlikely to be resolved and fully implemented for several years.³¹ Therefore, the instant waiver is necessary to allow deployment while that proceeding is pending. Further, making full use of the Licensed

Radio Service Providers and Other Providers of Mobile Data Service, Second Report and Order, 26 FCC Rcd 5411 ¶ 10 (2011) (recognizing that "the mobile broadband industry is in a critical stage of development, with a rapidly evolving mobile broadband ecosystem and a rapid increase in mobile broadband data use.").

²⁸ *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Docket No. 12-268, Notice of Proposed Rulemaking, FCC 12-118 ¶¶ 1, 3 (rel. Oct. 2, 2012) ("Our country faces a major challenge to ensure that the speed, capacity, and accessibility of our wireless networks keeps pace with these demands in the years ahead, so the networks can support the critical economic, public safety, health care, and other activities that increasingly rely on them.").

²⁹ *Interoperability Order* at ¶ 43.

³⁰ *See Qualcomm Order* at ¶ 28.

³¹ *Interoperability Order* at ¶ 45.

Spectrum through grant of this waiver request would promote efficient use of scarce spectrum resources, particularly spectrum under 1 GHz.³²

B. Grant of the Requested Waiver Is Consistent with the Purpose of the Rule

The underlying purpose of Section 27.60 would not be served by applying the rule to the unique circumstances in this case. Section 27.60 is designed to permit wireless spectrum to be utilized to the fullest extent possible while protecting incumbent DTV broadcast operations.³³ The rule requires DTV station consent for deployments where the D/U ratio and separation distances in Section 27.60 are not met, thus contemplating that there may indeed be circumstances where the DTV signal is not subject to harmful interference. The rule certainly does not contemplate a broadcast licensee's preventing deployment where the wireless carrier can demonstrate that DTV viewers are highly unlikely to suffer harm. Cricket has tried to obtain the Station's consent, but all outreach efforts to date have proven fruitless. Given these extraordinary circumstances, Cricket has no alternative but to seek a waiver to allow the Licensed Spectrum to be utilized.

The Commission has granted waivers of the DTV protection criteria where the wireless licensee has demonstrated through statistical modeling that the probability of interference is reasonably low. Significantly, the Commission has determined that the rules and precedent do not require that all interference be eliminated. Rather, the Commission acknowledges that Section 27.60 only requires that wireless operators "reduce the potential for

³² See *National Broadband Plan* at 85 (citing the technological and efficiency benefits of highly propagating lower frequency bands).

³³ *Access Spectrum Order* at ¶ 14 (stating the underlying purpose of the rule as permitting 700 MHz operations where it is demonstrated that adjacent channel interference to TV/DTV stations will be prevented).

interference to public reception of the signals of existing TV and DTV broadcast stations.”³⁴

Relying on this interpretation of the rule, the Commission has granted waivers of the DTV protection criteria where the licensee demonstrated that it would cause only *de minimis* interference to broadcast operations.³⁵ As in those cases, the Commission should find here that the underlying purpose of Section 27.60 would be frustrated by strict application of the rule, because Cricket has demonstrated that its proposed deployment would cause only *de minimis* interference to adjacent broadcast operations.³⁶

The Commission recognizes that, to maximize the public interest, spectrum uses should not be precluded where there is potential for adjacent operations to coexist, even where another licensed service may be subject to some limited interference. For example, the Commission relied on this balance between the beneficial use of spectrum and the potential for limited interference to broadcast operations, in permitting a *de minimis* level of interference into DTV operations by Qualcomm and New York State’s respective 700 MHz operations, as discussed above.³⁷ Likewise, the Commission has worked to facilitate the coexistence of Wireless Communications Service (“WCS”) and Satellite Digital Audio Radio Service (“SDARS”) operations in order to facilitate the deployment of mobile broadband services in the

³⁴ 47 C.F.R. § 27.60.

³⁵ See, e.g., *Qualcomm Order* at ¶¶ 28, 30 (considering to be *de minimis* interference affecting 0.5 percent of the population within the Grade B contour of a protected DTV station without discounting for cable and satellite penetration); *New York State Order* at ¶¶ 27, 29 (finding interference to 1 percent of the population to be *de minimis*).

³⁶ The calculation of the percentages of the population impacted in the *Qualcomm Order* and the *New York State Order* were based on the total population covered by the broadcast station’s signal *without* discounting for cable and satellite penetration. In the instant case, even when considering only the Station’s over-the-air viewers, the percentage of the OTA viewer population that may experience interference is well within the ranges allowed in those cases.

³⁷ See *Qualcomm Order* at ¶ 28; *New York State Order* at ¶ 29.

WCS bands, while balancing the need to protect SDARS repeaters in adjacent bands.³⁸ The Commission made clear that it did not intent to create “an environment where interference will never occur under any circumstances,” but instead sought to establish power limits that would ensure that seriously degraded or repeatedly interrupted reception would be rare.³⁹

Moreover, in establishing technical rules for AWS H Block and AWS-4 operations, the Commission required licensees to accept some level of interference.⁴⁰ The Commission reasoned that the public interest would be maximized by allowing use of adjacent spectrum despite the potential for interference, rather than to treat an adjacent band as a “permanent guard band,” which would preclude use of such spectrum.⁴¹ In implementing the Spectrum Act directive to prevent “harmful interference” by AWS H Block transmissions into adjacent PCS downlinks, the Commission recognized that mobile-to-mobile interference between mobile transmitters is inherently probabilistic, and that harmful interference was unlikely in scenarios where “a number of low probability events all need to occur before an

³⁸ *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band*, Report and Order, 25 FCC Rcd 11710 ¶ 28 (2010).

³⁹ *Id.*

⁴⁰ *AWS H Block Order* at ¶ 23 (finding that the technical rules adopted for use of the Lower H Block will allow commercial use of that spectrum without causing harmful interference into PCS operations, but that the rules “are not, nor could they reasonably be, designed to prevent all possible instances of interference generally.”); *AWS-4 Order* at ¶ 18 (requiring licensees of AWS-4 operating authority to accept some limited interference from operations in the adjacent AWS-2 upper H block at 1995-2000 MHz).

⁴¹ *AWS-4 Order* at ¶ 64; *see also id.* at ¶ 71, n.232 (adopting technical rules that “will best serve the public interest by striking an appropriate balance that will enable” the use of the AWS-4 band and the spectrum adjacent to that band, regardless of which band is put into use first).

actual Lower H Block transmission would seriously degrade, obstruct, or repeatedly interrupt the ability of the PCS mobile device to receive the PCS signal.”⁴²

Notably, even the Commission’s DTV broadcast station technical rules allow up to two percent of a DTV station’s population to be subject to predicted interference from another station, so long as the protected station is not, or will not be, receiving interference in excess of ten percent of its population from all combined interfering stations.⁴³ And in the broadcast context generally, the Commission has recognized that the predictive nature of the interference protection requirements results in the possibility of *de minimis* interference.⁴⁴

It is also noteworthy that the waiver requested in this case is not open-ended, but rather limited in nature. Once the incentive auction and the associated efforts to relocate/repack broadcast station operations are completed, Channel 51 will no longer be used for broadcast operations. Thereafter, the Channel 51 interference issue will no longer exist, the DTV protection criteria will no longer apply to operations on the Lower 700 MHz A Block, and a waiver will no longer be necessary. However, the Commission has acknowledged that the completion of the incentive auction and the resolution and implementation of Channel 51

⁴² *AWS H Block Order* at ¶ 23; see also Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, § 6401(b)(4), 125 Stat. 156, 223 (2012), codified at 47 U.S.C. § 1451(b)(4) (“Spectrum Act”).

⁴³ See *Qualcomm Order* at ¶ 29; see also 47 C.F.R. § 73.623.

⁴⁴ See, e.g., *Amendment of Parts 73 and 74 of the Commission’s Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations*, Report and Order, 19 FCC Rcd 19331 ¶ 103 (2004) (allowing digital LPTV stations to provide predicted interference to full-power TV stations up to a predicted threshold of 0.5 percent, despite the secondary status of digital LPTV stations); *Establishment of a Class A Television Service*, Report and Order, 15 FCC Rcd 6355 ¶ 78 (2000) (allowing DTV stations to cause up to a 0.5 percent reduction in service population to a Class A TV station).